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# “First, know thyself”: cognition and error in medicine

Fabrizio Elia<sup>1</sup> · Franco Aprà<sup>1</sup> · Andrea Verhovez<sup>1</sup> · Vincenzo Crupi<sup>2</sup>

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**Abstract** Although error is an integral part of the world of medicine, physicians have always been little inclined to take into account their own mistakes and the extraordinary technological progress observed in the last decades does not seem to have resulted in a significant reduction in the percentage of diagnostic errors. The failure in the reduction in diagnostic errors, notwithstanding the considerable investment in human and economic resources, has paved the way to new strategies which were made available by the development of cognitive psychology, the branch of psychology that aims at understanding the mechanisms of human reasoning. This new approach led us to realize that we are not fully rational agents able to take decisions on the basis of logical and probabilistically appropriate evaluations. In us, two different and mostly independent modes of reasoning coexist: a fast or non-analytical reasoning, which tends to be largely automatic and fast-reactive, and a slow or analytical reasoning, which permits to give rationally founded answers. One of the features of the fast mode of reasoning is the employment of standardized rules, termed “heuristics.” Heuristics lead physicians to correct choices in a large percentage of cases. Unfortunately, cases exist wherein the heuristic triggered fails to fit

the target problem, so that the fast mode of reasoning can lead us to unreflectively perform actions exposing us and others to variable degrees of risk. Cognitive errors arise as a result of these cases. Our review illustrates how cognitive errors can cause diagnostic problems in clinical practice.

**Keywords** Diagnostic errors · Decision making · Diagnosis · Medical errors

## Introduction

*To err is human:* This is not only a renowned time-tempered statement, but also the title of a landmark report published by the Institute of Medicine in 2000 which was to drive a profound change in the history of medicine [1].

Although error is an integral part of the world of medicine (maybe even more so in our time of technology-powered medicine), physicians have always been little inclined to take into account their own mistakes, thus avoiding frank discussion and analysis [2, 3]. While the study of the various reasons behind this fact is beyond the scope of our contribution, it is interesting to point out that in other fields (e.g., aviation) the analysis of mistakes has served as a means for improvement and development [4]. More recently, the use of methods originally devised in other fields (e.g., checklists) has been proposed as a solution to tackle systematically some sources of medical errors, including the cognitive ones [5, 6].

There has always been a taboo attached to error in medical decision making as the medical profession, focused as it is on patient’s health, imposed the impossibility of making mistakes. This is part of the “metaphysical halo” which has surrounded the medical profession for a long time and whose legacy is still lasting and influential.

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Managed by Massimo Porta.

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✉ Franco Aprà  
francoapra@tiscali.it  
Fabrizio Elia  
fabrizioelia@libero.it

<sup>1</sup> High Dependency Unit, San Giovanni Bosco Hospital, Piazza Donatore del Sangue 3, 10154 Turin, Italy

<sup>2</sup> Department of Philosophy and Education, Center for Logic, Language, and Cognition, University of Turin, Turin, Italy